

CALPASTATIN IS UPREGULATED IN MYCOPLASMA HYORHINIS-INFECTED SH-SY5Y NEUROBLASTOMA CELLS: INHIBITION OF CALPAIN ACTIVITY AND ATTENUATION OF AMYLOID-Beta-TOXICITY

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Background: Mycoplasmas often contaminate cultured cells, leading to alterations in synthetic and metabolic pathways. Mycoplasmal contamination is often unnoticed, so that altered cell functions may not be appreciated, unless specifically studied. Calpain (Ca²⁺-dependent protease) and calpastatin (endogenous inhibitor) play an important role in a variety of cellular processes. SH-SY5Y cells are widely used for investigations on neurodegenerative disorders, such as Alzheimer's Disease (AD). We have found for the first time that contamination of SH-SY5Y cells by *Mycoplasma hyorhinis* (Mh) leads to increased levels of calpastatin, resulting in inhibition of calpain activity in the Mh-infected cells. Objective: To investigate the effects of amyloid-Beta-peptide (Ab) (important in the pathogenesis of AD) on uncontaminated (clean) and Mh-infected SH-SY5Y cells. Results: Ab is toxic to clean cells. It leads to cell membrane permeability of propidium iodide (PI) (without nuclear changes), diminished mitochondrial enzyme activity (XTT reduction), activation of calpain and enhanced proteolysis. Ab-toxicity is attenuated in Mh-infected cells (similar to Ab-toxicity inhibition in clean cells overexpressing calpastatin). Staurosporine-toxicity is different and affects both clean and infected cells (causes nuclear apoptotic alterations, without PI permeability, without effect on XTT reduction). Conclusions: Since the ratio of calpastatin to calpain is an important factor in the control of calpain activity, the elevated calpastatin may protect mycoplasma-infected cells against certain types of damage. Our results are important for studies on host cell-mycoplasma interaction. The results imply an effect of mycoplasma on cell response to certain insults and suggest modulation of some diseases in the presence of mycoplasmal infections.